California Department of Boating and Waterways

EGERIA DENSA CONTROL PROGRAM

ANNUAL REPORT 2008

NPDES Permit No. CAG9900032007

NOAA Fisheries B.O. No. SWR-020SA-00683: JSS

USFWS B.O. No. 1-1-04-F-0148

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EXECUTIVE SUMMARY

Egeria densa (Brazilian Waterweed) is a fast growing submerged invasive aquatic plant that is having a significant impact on shallow-water habitat in the Sacramento/San Joaquin Delta (Delta) ecosystem. In the past 45 years since *Egeria densa* (*E.densa*) was introduced into the Delta, it has grown to infest approximately 10,000 acres or 18% of the 55,000 surface acres of the Delta. *E. densa* influences the Delta's biological diversity, recreation, and agriculture. It crowds out native plants, slows water flows, entraps sediments, obstructs waterways, impedes anadromous fish migration patterns, and clogs water intakes.

In 1997, AB 2193, amended the California Harbors and Navigation Code (Chapter 2, Article 2, Section 64) to designate the California Department of Boating and Waterways (Cal Boating) as lead agency for the control of *Egeria densa* in the Sacramento/ San Joaquin Delta, its tributaries, and the Suisun Marsh.

The Egeria Densa Control Program (EDCP) operates under the auspices of several federal and state agencies. The National Pollution Discharge Elimination System General Permit for Aquatic Pesticides Use (NPDES) (ref: No. CAG 990005) issued by the State of California Water Resources Control Board (SWCRB), Division of Water Quality (DWQ) and is administered by the Central Valley Regional Water Quality Control Board (CVRWQCB). The EDCP also operates under the United States Fish and Wildlife Service (USFWS) Biological Opinion (BO) (ref: 1-1-04-F-0148) and the National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA Fisheries) (BO) (ref: SWR: 2005SA00683:JSS). This report is prepared to satisfy the requirements of the SWRCB NPDES Permit, the USFWS BO and the NOAA Fisheries BO.

During the 2008 treatment season Cal Boating incurred one violation to the NOAA BO. Herbicide residues migrated from the treatment area into sites that were not permitted to be treated until later in the treatment season. NOAA Fisheries was immediately contacted. NOAA indicated that if the residues did not exceed 5 parts per billion (ppb) then it was okay to continue treatment. Levels found were within 2 to 3 ppb and never exceeded the agreed upon level of 5 ppb. All other terms and conditions of the Biological Opinions and NPDES permit were satisfied.

Cal Boating has achieved high efficacy in Franks Tract. We have been treating the area for the last two years. Prior to that time Cal Boating treated numerous small areas with limited success. Due to this limited success, it was decided to try a different approach and treat a large nursery area. Cal Boating arrived at this decision through discussions with stakeholders and

following the adaptive management ideology. In 2007 Cal Boating started a 3 year program to treat Franks Tract which is a nursery and inundated with E. densa.

Treatment began in April of 2007 and continued twice per week for eight weeks. The second year of treatment began in April 2008, twice per week, for ten weeks. The total reduction of *E. densa* from the baseline survey in December 2006 to December 2008 was 59.4% Bio-Cover and 31.6% in Bio-Volume.

In December 2006 the total Bio-Cover was 79.4% and in December 2008 the total was 20.0%. Bio-Cover can be described as the total area of the bottom covered with vegetation. The December 2006 total Bio-Volume was 32.1% and in December 2008 the total was 0.5%. Bio-Volume can best be described as a combination of Bio-Cover and height information that estimates the percentage of the water column occupied by submersed vegetation at any given point.

With the reduction of the *E. densa* in Franks Tract native pondweeds have begun to reestablish themselves in the area. We have also received numerous favorable comments from users of the area, residents and people who work in the area. The reduction in *E. densa* in 2007 and 2008 was so significant it was decided the third year would not be cost and time beneficial compared to any additional reduction in *E.densa* that might be achieved.

Therefore, we are now going to move to the eastside of the Delta to another area thought to be a large nursery. We will continue to monitor Franks Tract to determine how long it will take the *E. densa* to reestablish itself. It is likely Cal Boating will return to Franks Tract in several years to treat it again.

1 INTRODUCTION

1.1 Impact of Egeria densa on the Delta and Tributaries

Egeria densa is a fast growing submerged invasive aquatic plant that is having a significant impact on the Sacramento/San Joaquin Delta. It has grown to infest approximately 10,000 acres of the 55,000 surface acres of the Delta. E. densa influences biodiversity, recreation and agriculture. It crowds out native plants, entraps sediments and can impede anadromous fish migration patterns. It also interferes with recreational activities such as boating, swimming and fishing. Commercial effects caused by the presence of E. densa can include interference with irrigation project pumps, hydroelectric utilities and urban water supply pumps.

Egeria densa collected in Franks Tract

1.2 Summary of Statutory Authority

In 1997, AB 2193 amended the California harbors and Navigation Code (Chapter 2, Article 2, Section 64) to designate Cal Boating as lead agency for controlling E. densa in the Sacramento/San Joaquin Delta, its tributaries and the Suisun Marsh.

1.3 Summary of Regulatory Permits

Cal Boating Egeria densa Control Program operates under the auspices of several federal and state permits and biological opinions. These include a national Pollution Discharge Elimination System General Permit for Aquatic Pesticide Use, a United States Fish and Wildlife Service Biological Opinion, Section 7 Take Permit and a National Oceanic and Atmospheric Administration, National Marine Fisheries Service Biological Opinion Section 7 Take Permit.

1.4 EDCP NPDES Permit (No. CAG 990005)

The EDCP NPDES General Permit for Aquatic Pesticide Use requires Cal Boating to submit an annual report March 1 following the EDCP treatment season. Reporting per NPDES guidelines must include an executive summary discussing general permit compliance or violations of permit terms and conditions to beneficial waters of the U.S., the effectiveness of the EDCP Aquatic Pest Application Plan (APAP), the discharge of pollutants associated with aquatic pesticide applications, summarize monitoring data, including changes in water quality, and violations of compliance with water quality objectives as outlined in the Central Valley Basin Plan. The report will also include a discussion of any violations and actions taken, maps showing application areas, acreage and sampling station locations, types and amounts of aquatic pesticides used during each application event, information of surface area, volume and rate of application sampling results for all monitoring as outlined in the General Permit Monitoring and Reporting Program.

1.4.1 TERMS AND CONDITIONS

Herbicide Residue Limits

The maximum residue limits in receiving waters for fluridone, the main ingredient of Sonar®, is 560 parts per billion (ppb) and for diquat, the main ingredient in Reward®, the maximum is 20 ppb. Cal Boating did not use any diquat during the 2008 treatment season. Maximum residue limits are based on Environmental Protection Agency (EPA) and municipal drinking water standards.

There are clear distinctions in the NPDES Permit about the application area, treatment area, and receiving waters. An application area is defined as the area in which the aquatic herbicide is applied. The treatment area is the area that is treated by the aquatic herbicide to control aquatic weeds. The receiving waters are defined as: 1) waters directly down flow of the treatment area and 2) water within the treatment area when herbicide residue levels fall below the minimum effective concentrations. In the EDCP the herbicide can have an impact on the

target species as long as residues are present in the water column. Residues found inside the treatment area are not usually considered receiving waters until seven days after an application event.

Herbicides applied to aquatic plants are not considered a pollutant until residues reach the receiving waters. This is because herbicides designed to treat aquatic plants and approved by the EPA cannot also be considered a pollutant under the Clean Water Act. This applies to chemicals approved under Federal and California pesticide use regulations.

The EPA Label restrictions dictate maximum rates of application and maximum concentrations in the water column. The application rate can be greater than the maximum water column concentration due to binding properties and dispersion rates in flowing waters. Fluridone has no maximum application rate in flowing waters. The applicator is allowed to apply at an appropriate rate such that the target concentration in the water column does not exceed 40 ppb. However, most applications have target applications of 50 ppb or less with a residue of 10 ppb or less in the water column upon dispersion.

Water Quality Parameters

The EDCP is required to monitor specific water quality parameters to ensure there are no significant impacts to beneficial waters of the United States (NOAA Fisheries Biological Opinion and NPDES Permit) The physical and chemical water quality parameters monitored consist of temperature, salinity, electrical conductivity, turbidity, pH, and dissolved oxygen. Cal Boating also conducts a visual inspection before, during and after applications have been made. Cal Boating annotates any changes in water color, water odor, and vegetation health.

Selection and Monitoring Frequency

The NPDES permit requires representative monitoring for each water type found in the EDCP area of operation. The only water type for the control program is tidal. Per monitoring frequency requirements outlined in the NPDES and EDCP Aquatic Pesticide Application Plan, a minimum of two monitoring sites per water type per herbicide used if the total number of application treatments is below twenty. Cal Boating records water quality parameters the day of sampling (pre) and a minimum of two follow-up visits following the end of the treatment event until there are no detectable residues.

1.5 EDCP USFWS BO/Section 7 Permit

1.5.1 Reporting Requirements

The USFWS Biological Opinion/Section 7 Permit requires Cal Boating to submit an annual report January 31 following the EDCP application season. Annual reports must summarize compliance

with the terms and conditions listed to include species and habitat protection, water quality monitoring, and any additional monitoring and studies that may have been conducted as part of the regulatory requirements from other participating state and federal agencies. Additional reporting requirements are on a case by case basis in the event that a *"take"* should occur with any of the discussed species in the permit. Take reports begin with immediate notification of the USFWS biologist in charge of administering the permit and require legal documentation of such information as to where the *"take"* occurred, number of species involved, water quality conditions, chain of custody, and prescriptive action for preventing future occurrences.

1.5.2 Mitigation Requirements

The EDCP USFWS BO Section 7 Take Permit imposes several measures to avoid impacts to protected species in the Delta. Primarily Cal Boating has been directed to implement species avoidance and species and habitat loss minimization. There are three main components to avoidance and habitat minimization mitigation. Components are seasonal timing of applications, species specific toxicity evaluations, and education of applicators. All applicators received worker environmental awareness training before the treatments started in April. Personnel were informed as to the presence of Valley Longhorn Elderberry and the habitat associated with this species, other specific mitigation for the Giant Garter Snake and Delta Smelt. The briefing also included the contents of the USFWS and NOAA Fisheries BO Section 7 Permits.

Delta Smelt (*Hypomesus transpacificus)*

Delta Smelt

1 – Using the Interagency Ecological Program (IEP) Real Time Monitoring Program 20 mm Survey determine the presence/absence of Delta Smelt

2 – There are no restrictions for the use of fluridone, however if diquat is used it may only be applied between June 1 and Jul 31. Cal Boating used no diquat during this reporting period.

Valley Longhorn Elderberry Beetle (*Desmocerus californicus dimorphus*)

Valley Longhorn Elderberry Beetle

The Valley Longhorn Elderberry Beetle is in the federal process of being de-listed. However, Cal Boating will continue to monitor and observe all mitigation set forth by the USFWS.

1 – Avoidance is the primary term that USFWS has included in their Biological opinion.

2 – The area of operation for the EDCP has been surveyed as to the location of the Elderberry tree (*Sambucus ssp*).

3 – EDCP treats at low tide if there are any Elderberry trees within 100 feet of the water's edge. If treatment cannot occur away from the habitat then a maximum of one half the area may be treated at one time. The areas Cal Boating treated in 2008 contained no Elderberry trees.

Giant Garter Snake (*Thamnophis gigas*)

Giant Garter Snake

1 – Avoidance of Giant Garter Snake habitat.

The only restrictions to Giant Garter Snake apply to mechanical harvesting and land based operations occurring on unimproved Delta banks. The EDCP currently is not implementing any mechanical harvesting nor is it operating on or near any unimproved areas. However, mitigation beyond the requirements of the USFWS permit has been implemented to avoid impact. All of the EDCP project area has had a Giant Garter Snake habitat evaluation. Each application crew has been provided with a set of maps outlining potential Giant Garter Snake habitat. This is to ensure that our crews avoid areas where Giant Garter Snakes are likely to be found.

1.6 EDCP NOAA Fisheries B/O Section 7 Permit

1.6.1 Reporting Requirements

The NOAA Fisheries Biological Opinion/Section 7 Permit requires Cal Boating to submit an annual report January 31 following the EDCP application season. Annual reports must summarize compliance with the terms and conditions listed to include species and habitat protection, water quality monitoring, and any additional monitoring and studies that may have been conducted as part of the regulatory requirements from other participating state and federal agencies. Additional reporting requirements are on a case by case basis in the event that a *"take"* should occur with any of the discussed species in the permit. Take reports begin with immediate notification of the NOAA Fisheries biologist in charge of administering the permit and require legal documentation of such information as to where the *"take"* occurred, number of species involved, water quality conditions, chain of custody, and prescriptive action for preventing future occurrences.

1.6.2 Mitigation Requirements

The EDCP NOAA Fisheries BO Section 7 Take Permit imposes several measures to avoid impacts to protected species in the Delta. Primarily Cal Boating has been directed to implement species avoidance and species and habitat loss minimization. There are three main components to avoidance and habitat minimization mitigation. Components are seasonal timing of applications, species specific toxicity evaluations, and education of applicators. All applicators received worker environmental awareness training before the treatments started in April. The briefing included the contents of the USFWS and NOAA Fisheries BO Section 7 Permits as well as what to do if an incidental "*take*" is discovered.

Chinook Salmon, *Oncorhynchus tshawytscha* (Sacramento River winter run and Central Valley Spring-run) and Central Valley Steelhead Trout, *Oncorhynchus mykiss*

Chinook Salmon

1 – NOAA Fisheries has given Cal Boating specific start and stop dates which a treatment can begin and when it must end. Cal Boating cannot start any treatments before April 1st and must cease all treatments no later than October 15th.

2 – NOAA Fisheries has also set specific sites and dates when treatment can start. This is to preclude out or in migrating salmonids from passing through treated areas.

3 – In order to avoid impacts to aquatic species, particularly salmonids, reliant on dissolved oxygen (DO) levels, crews monitor DO levels and water temperature prior to and after treatments. Crews are only permitted to make applications when DO levels are above 5 mg/l or below 3 mg/l. During the 2008 season all DO levels were within the specified parameters[1].

[1] The CVRWQCB, USFWS, and NOAA Fisheries have slightly different dissolved oxygen limits. The CVRWQCB Basin Plan states the DO shall not be reduced below 5.0 mg/l in all Delta waters, except the Sacramento River below the I Street Bridge and waters west of the Antioch Bridge (7.0 mg/l) and in the San Joaquin River between Turner Cut and Stockton (6.0 mg/l). All EDCP sites for 2008 are, by the Basin Plan definition, waters of the Delta. The USFWS BO/Take Permit directs no treatment in high flow areas where the DO levels are below 5.0 mg/l. It also directs treatments to be delayed in low-flow areas if DO levels are between 4-6 mg/l. The Central Delta is all tidal and with no real distinction between high-flow and low-flow waters. All areas treated during the 2008 season were in the above 5.0 mg/l category and Cal Boating did not have any levels below 5.0 mg/l.

2 Personnel, Materials, and Methods

2.1 EDCP Personnel, Accreditation, and Training

Application Crew

2.1.1 Application Crews

Each application crew consists of a specialist and a technician of which at least one is a certified applicator possessing a Qualified Applicator Certificate “F” (aquatics). This certification is administered by the California Department of Pesticide Regulation (DPR). All Cal Boating crews have been trained on EDCP herbicide use and environmental awareness.

2.1.2 Herbicide Application Accreditation and Training

All Cal Boating crews attended the 2008 California Department of Fish and Game Pesticide Applicators Seminar on March 4-6. While attending the seminar each crew member received his continuing education credits for the year. Additionally they receive periodic tailgate refresher training to review guidelines and restrictions during the application season of April 1st to October 15th.

2.1.3 Endangered Species Training

Cal Boating perceives training as a major component necessary to ensure avoidance and minimization measures are met for both the NOAA Fisheries and USFWS BO Sec 7 Permits. Application crews not only received refresher training on herbicide use and restrictions before the application season began, they also received an annual environmental awareness refresher course on EDCP threatened and endangered species and species of concern.

State and federally listed threatened and endangered species and species of concern training for the EDCP project area included:

- A discussion of legal implications of the Endangered Species Act (ESA) and the California Endangered Species Act (CEQA),
- Identification of all endangered and threatened species and species of concern in the project area,
- Special permit requirements for Delta Smelt, Giant Garter Snake, Valley Longhorn Elderberry Beetle, Central Valley Steelhead Trout, and Chinook Salmon including buffer zones, required surveys, fish passage protocol, and DO limits.

2.1.4 Monitoring Crews

Monitoring crews consist of a lead Environmental Scientist and one additional person to assist the scientist. The lead scientist is responsible for training, planning, and scheduling field sampling events. Additional responsibilities include quality control (QA/QC) of field water quality monitoring and lab analysis and the reporting of findings in an annual report as outlined in the EDCP NPDES, USFWS and NOAA Fisheries Biological Opinions.

2.2 Materials

2.2.1 Herbicide Application

Herbicides

The herbicides used during the 2008 EDCP treatment season include:

- Fluridone: 1-methyl-3-phenyl-5[3-(trifluoromethyl_phenyl]-4(1H)-pyridinone; under the commercial trade names of:
    - Sonar A.S.® – EPA Registration No. 67690-4 (liquid)
    - Sonar PR Precision Release® – EPA Registration No 67690-12 (Pellet)
    - Sonar Q Quick Release® – EPA Registration No. 67690-3 (Pellets)

Fluridone

Fluridone (Sonar®) is a selective systemic herbicide that inhibits the formation of carotene, an action that results in the degradation of sunlight exposed chlorophyll. Formation of carotene occurs primarily in new growth, thus fluridone is most effective in maximum growth periods of *E. densa*. Fluridone not absorbed by plants is broken down into naturally occurring elements mostly through exposure to sunlight.

Table 2-1 Summary of Pesticide Use in 2008

	Fluridone Granular (PR) (lbs)	Fluridone Granular (PR) (acres)	Fluridone Aqueous (AS) (Gals)	Fluridone Aqueous (AS) (acres)	Fluridone Pellet (Q) (lbs)	Fluridone Pellet (Q) (acres)
APRIL						
Contra Costa	0	0	121	2901	52640	16976
MAY						
Contra Costa	5535	2428	0	0	27720	12546
JUNE						
Contra Costa	3960	3343	0	0	0	0
	9495	5771	121	2901	80360	29522

NOTE: Acreages in Table 2-1 are gross acreages. Net acreage treated was 2,571 acres.

Application Equipment

Air Boat Operator performing liquid herbicide injection

At the start of each treatment day the application crew will take a dissolved oxygen and water temperature reading using a HACH® Dissolved Oxygen Meter within the treatment site. These readings must be within the parameters outlined in the Biological Opinions and NPDES Permits

before application of any herbicide is started. After the readings are within parameters the crew will start application from a 19-21 foot aluminum boat either air or outboard powered. The crew also uses an Explore™ iX-104C² Tablet PC with a GPS unit installed to record starting point UTM coordinates, draw spray lines, end point coordinates and date and time of treatment.

All boats are maintained regularly, including oil changes every 50 hours, washed to rid them of chemical residues, and all application pumps hoses and nozzles are inspected and replaced on an as needed basis. Boat maintenance records are available upon request.

2.3 Environmental Monitoring

2.3.1 Monitoring Equipment

A 21 foot aluminum Gregor™ or 22 foot fiberglass C-Dory™ both powered by outboard motors are used for monitoring activities. Cal Boating purchased a new water sampler, a portable Masterflex E/S®, to collect samples for chemical residue analysis. This reduces the number of equipment blanks because the tubing is changed between each sampling site eliminating contamination from site to site. Water quality measurements are collected using a Hydrolab MS-5® water quality multi-probe Datasonde. The MS-5 collects readings of water temperature, electrical conductivity, salinity, dissolved oxygen, pH, and turbidity. The data is stored together with GPS coordinates with an Ixplore 104C² PC Tablet. A digital camera is used to obtain visual records of sampling locations to denote noticeable changes in vegetation or the condition of the surrounding area.

2.2.3 Efficacy Monitoring Methodologies

Hyperspectral Analysis

The University of California at Davis conducts Hyperspectral imagery analysis for Cal Boating. This program was started in 2003 to try to show Cal Boating where the *E. densa* was located using airborne photo-imagery and analysis. Hyperspectral imagery utilizes unique reflective signatures that each plant emits. The technology is more advanced than infrared imagery, but unfortunately is not yet fully developed to distinguish between various submerged vegetation types found in the Delta. Results have shown improved precision and accuracy in monitoring the Absence/presence of submerged vegetation, however, the distinction between *E. densa* and other submerged vegetation has not yet been achieved.

Hydroacoustic Analysis

The hydroacoustic study performed by ReMetrix LLC involve a smaller scale monitoring of application sites and untreated control sites similar to the application sites. Using sonar type technology, vegetative cover (Bio-Cover) on the water body floor and the amount of vegetative plant matter present (Bio-Volume) were measured. Linear transects were also used to sample vegetation for ground truthing and inventories of submerged species present and their physiological condition at the time of sampling. During the 2008 application season a pre-survey was conducted, a 60 day post survey and a 120 day post survey have been completed. A

final survey was conducted in December 2008. The final survey was compared to the baseline survey in 2006 and the survey from 2007 to find how well the *E. densa* is being managed. From the baseline survey in 2006 Bio-Volume was calculated at 32.1% and Bio-Cover was 79.4%. In the 2007 survey Bio-Volume was calculated at 9.4% a reduction of 22.7% and Bio-Cover was 65.3% a reduction of 14.1%. The results of the 2008 survey showed Bio-Volume reduced from 9.4% to 0.5% a reduction of 8.9% and Bio-Cover reduced from 65.3% to 20%. The effects of this reduction are now boats can navigate freely within Frank's Tract and boat propellers cannot reach the *E. densa* to cut it and cause fragments to flow to other areas in the Delta and re-colonize.

2.2.4 Monitoring Activities

Environmental Monitoring Protocol

Cal Boating EDCP follows a water quality monitoring protocol as outlined in the 2004 EDCP Aquatic Pest Application Plan (APAP). The monitoring team planned each sampling event in conjunction with the field supervisor and the application teams. Each site is representative of water types in the Delta. During the 2008 season, Cal Boating sampled all sites treated.

Residue Sampling

For each application event Cal Boating takes a pre-sample and as many post samples as necessary until a non-detection of the herbicide is obtained. These samples are identified as sample location A, B, and C. Sample location A is inside of the application area approximately ¼ to 1/3 the distance in from the downstream edge of the application polygon, sample location B is located on the downstream edge of the application polygon, and sample location C is located in an adjacent non-impacted location with similar hydrological conditions to the receiving waters.

Water Quality Parameters

At the time of residue sampling water quality sampling is also conducted.

The physical and chemical water quality parameters monitored are water temperature, dissolved oxygen, pH, turbidity, electrical conductivity, and salinity. All of these samples are taken at a depth of three feet. Cal boating conducts visual inspections and records any changes in water or vegetation.

2.2.5 Laboratory Analytical Methods and Data Validation

Analytical Methods

The analytical methods used by the contract laboratories are published in the U.S. EPA Test Methods for Evaluating Solid Waste Physical/Chemical SW 846 or U.S. EPA Method for Chemical Analysis of Water and Waste. The primary method used for the EDCP is Method 4000, immune assay testing (ELISA method).

Analytical Testing Validation

Cal Boating uses three methods to validate results found by contracting laboratories. The methods used are:

- Splits/Dual Analysis – For each sampling event a split sample was taken. All split samples were within the acceptable range
- Field Spike – one field spike was taken and was within the EDCP QAPP acceptable range.
- Field Blanks – For each sampling event a field blank was taken. All field blanks were non-detect.
- Equipment Blanks – A total of 7 equipment blanks were taken. All Equipment blanks were non-detect.

3 COMPLIANCE AND MONITORING RESULTS

3.1 Herbicide Application Data and Permit Compliance

The 2008 EDCP application season was from April 7, 2008 to May 31, 2008. Cal Boating treated only one location consisting of three sites. The treated sites were within Frank's Tract in the western Delta and consisted of 2571 acres.

3.1.1 Compliance

Cal Boating EDCP treatment operations were in compliance with all portions of the NPDES, Aquatic Pesticide Application Plan and the USFWS BO. We were in violation of the NOAA BO in one instance discussed below.

Higher than originally expected residues (>3 ppb) were found during Fastest (immune-Assay) analysis taken on April 12 2008 at Rhode Island (Site 99). Rhode Island has an April 1 treatment start date permitted by the NOAA BO. Cal Boating started to use the Fastest sample outward from Franks Tract in all directions to determine how far the residues had gone. The results of these samplings showed that the residues had in fact reached areas where Cal Boating did not have early start dates. Cal Boating immediately notified Mr. Jeff Stuart of NOAA Fisheries to inform them of the violation and receive guidance on how to proceed. In both verbal and email confirmation it was determined that as long as residue levels did not reach 5 ppb, with a preferred level of <3 ppb Cal Boating could continue to treat Franks Tract. Cal Boating accomplished an extensive number of Fastests to ensure that the residue levels in all areas within and outside of Franks Tract did not exceed the levels set forth by NOAA Fisheries.

There were no known take or harassment of federally endangered or threatened species. Interagency Ecological Program (IEP) surveys as well as Department of Fish and Game Trawls were checked prior to and during the treatment season. These databases were checked for the presence of Chinook Salmon, Steelhead Trout, and Delta Smelt beginning March 27, 2008 and concluded June 23, 2008.

3.1.2 Basin Plan Compliance (NPDES)

Cal Boating is required to adhere to all limitations set forth in the Regional Water Quality Control Boards Basin Plan. They have set limitations for dissolved oxygen, turbidity, pH, salinity, turbidity, and temperatures.

Dissolved Oxygen

The limits set forth in the Basin Plan are that no dissolved oxygen levels should be below 6.0 mg/l in the San Joaquin River between Turner Cut and Stockton from Sept 1 to November 30,

and 5.0 mg/l in all other waters of the Delta. Cal Boating recorded readings between 6.6 mg/l and 13.1 mg/l. in all phases of the treatment.

pH

Limits for pH are nothing below 6.5 or elevated above 8.5. Cal Boating recorded readings between 7.1 and 8.4 during the 2008 treatment season.

Turbidity

For Delta waters the turbidity for the central Delta shall not exceed 50 Nephelometric Turbidity Units (NTUs) and 150 NTUs for other areas of the Delta. Cal Boating recorded readings between 3.9 NTUs and 49.2 NTUs. The high reading was caused by maneuvering the sampling boat in shallow water causing the disturbance of the bottom.

4 DISCUSSION AND CONCLUSIONS

4.1 Herbicide Application Compliance

All applications performed by Cal Boating during the 2008 treatment season were in compliance with the Pesticide Control Recommendations (PCR), the USFWS Biological Opinion and the NPDES permit. There was one violation to the NOAA Biological Opinion which was the dissipation of herbicide into areas where Cal Boating was not authorized to treat. This violation is discussed in section 3.1.1 of this report.

4.2 Monitoring Compliance

Overall all water quality parameters reflected ambient conditions in the Delta prior to, during and after the application of herbicides. Cal Boating accomplished all water quality and herbicide residue concentration monitoring during the application season. Cal Boating monitored the application and surrounding areas a total of five times during the treatment season. This included one pre sample to determine baseline conditions within the treatment area, receiving waters, and unaffected waters. A total of four post samples were taken to determine when the waters of the treatment and surrounding areas had no chemical residues.

4.3 Conclusions

The 2008 treatment season was a success in the battle to control *E. densa* within the Delta. During the 2008 treatment season Cal Boating EDCP continued with the strategy of treating suspected nursery areas. A total of 2,571 acres were treated in 2008.

Preliminary analysis of the effect of treatment, by ReMetrix LLC, using hydroacoustic measurements, shows there was an approximate reduction of 45.3% Bio-cover and 8.9% Bio-volume from December 2007. This added to the results from December 2006 to December 2007 have netted the EDCP a total reduction of 31.6% in Bio-volume and a 59.4% in Bio-cover. This is an extremely good result.

Cal Boating did have one violation of its NOAA Biological Opinion which was quickly taken care of. Cal Boating notified NOAA Fisheries immediately upon realization of the violation and obtained corrective measures which both NOAA and Cal Boating could abide by.

Overall Cal Boating has had a successful 2008 season and is looking forward to taking the lessons learned while treating a large nursery area and using it to treat other nursery areas

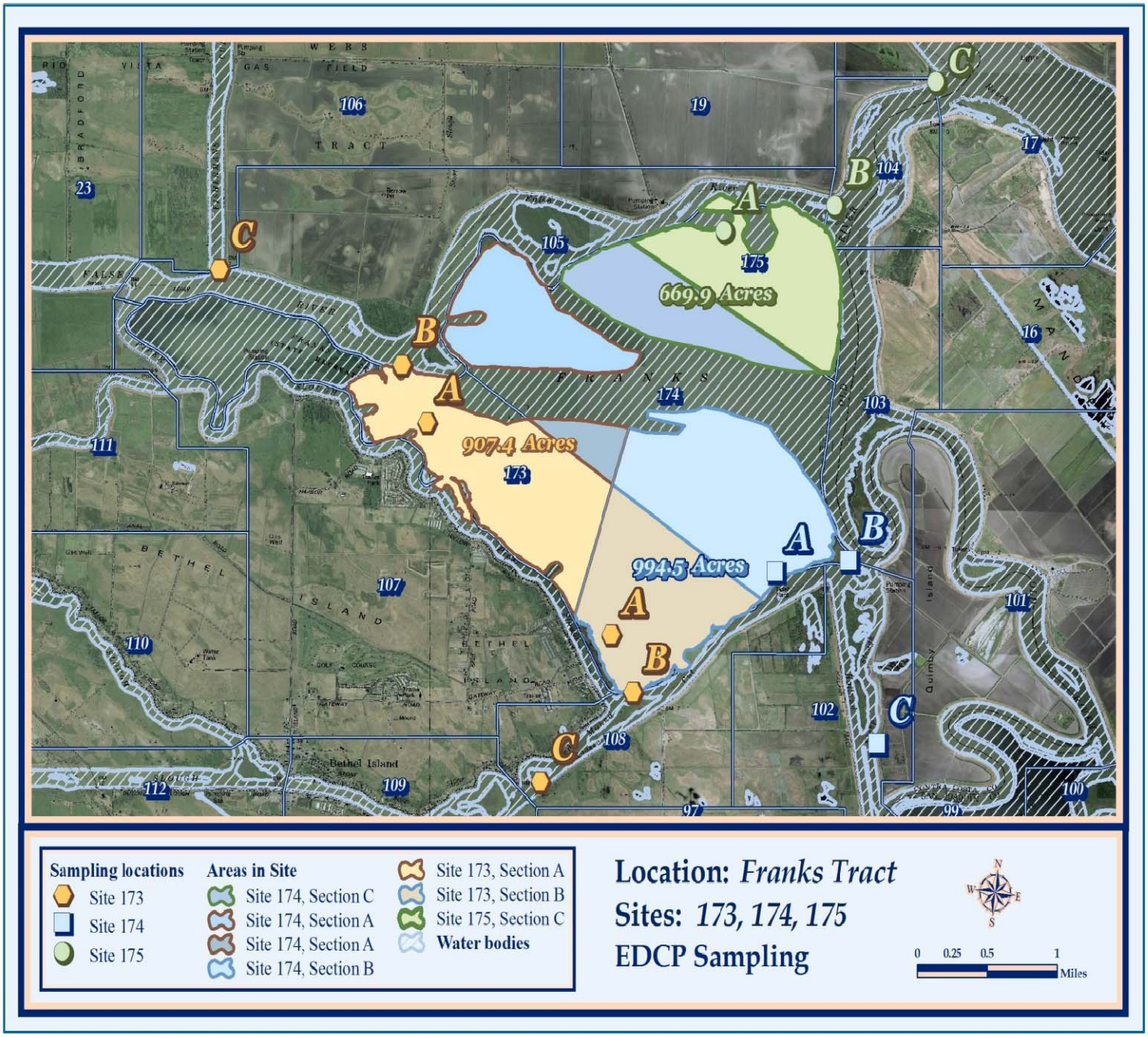
within the Delta. Cal Boating is planning on treating a smaller nursery area in the east Delta in 2009. This treatment would use less herbicide and treat a similar size area.

APPENDIX A

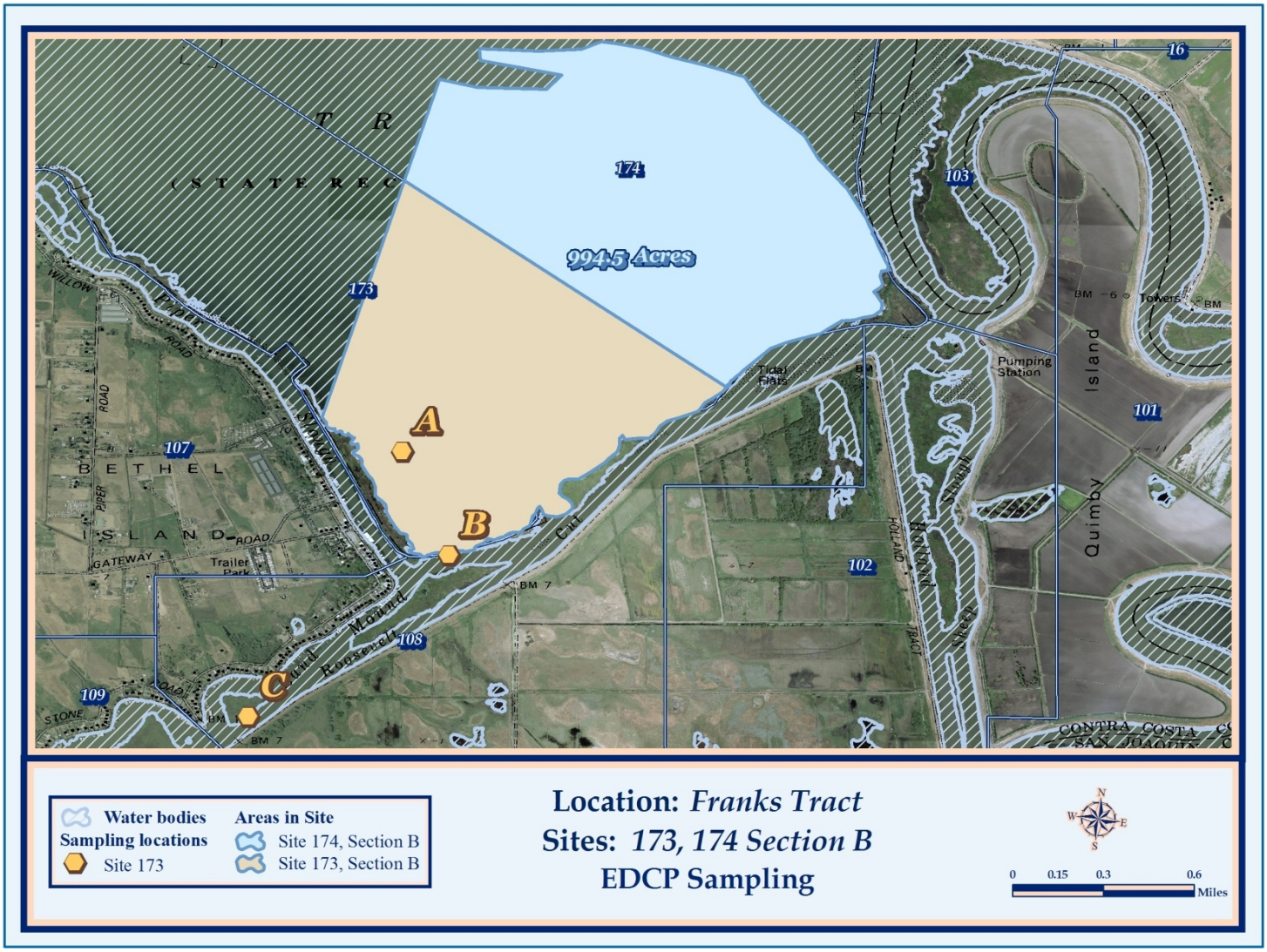
1 – Site Maps for Franks Tract Sites – 173S, 173N, 174, and 175

2 – Water Quality and Chemical Residue Data for all sites sampled in 2008

Franks Tract Sampling Locations



Franks Tract Site 173S



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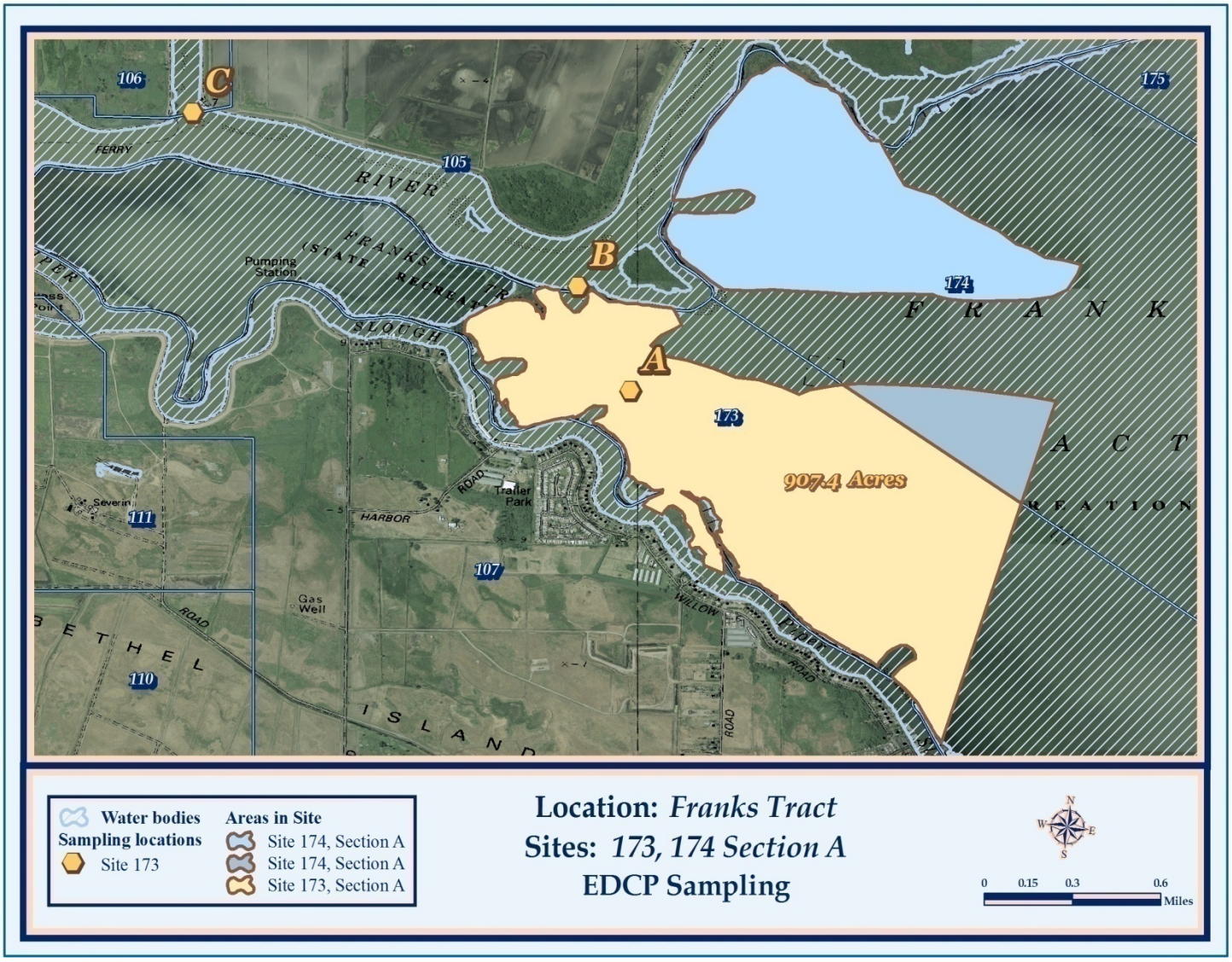
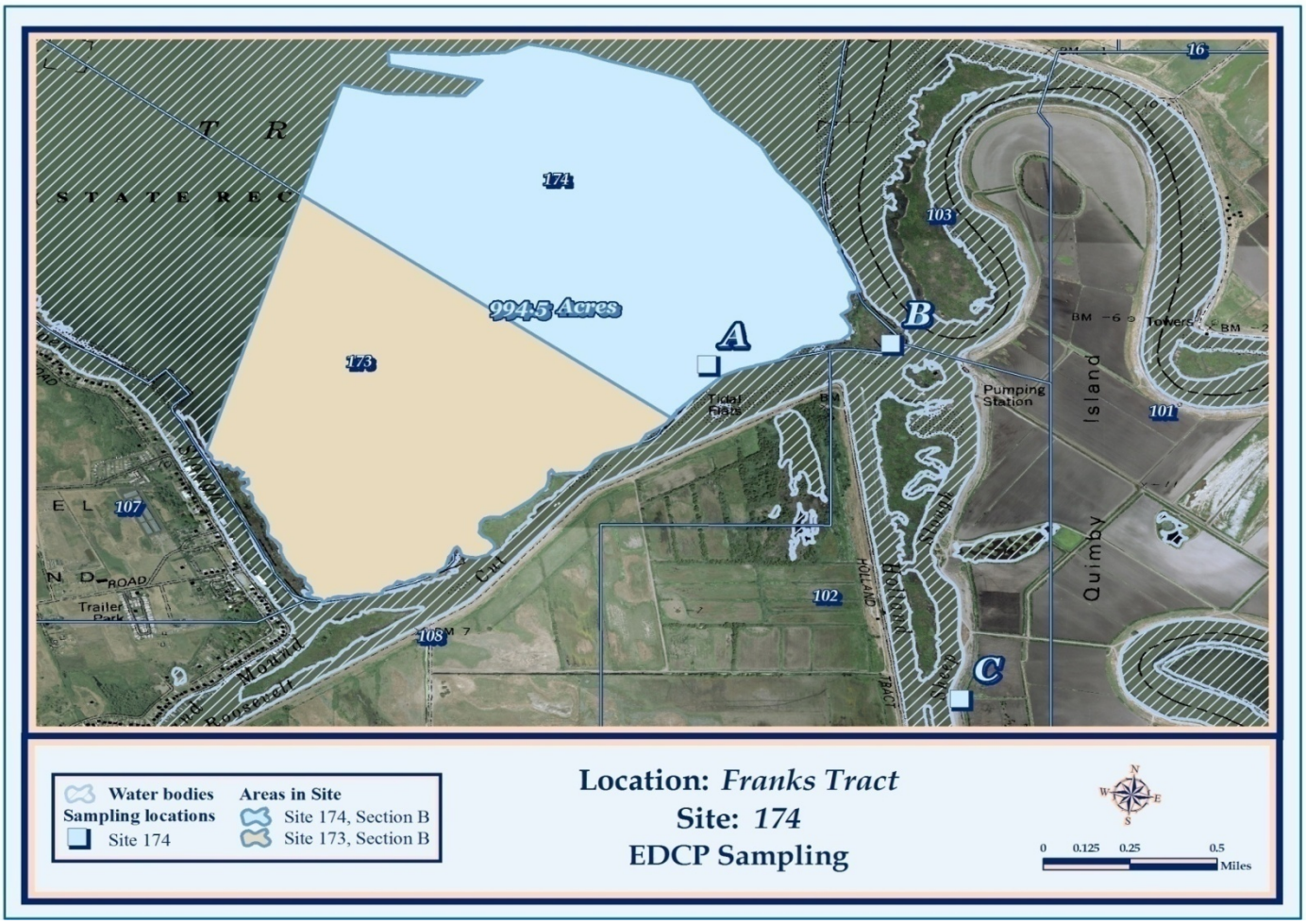
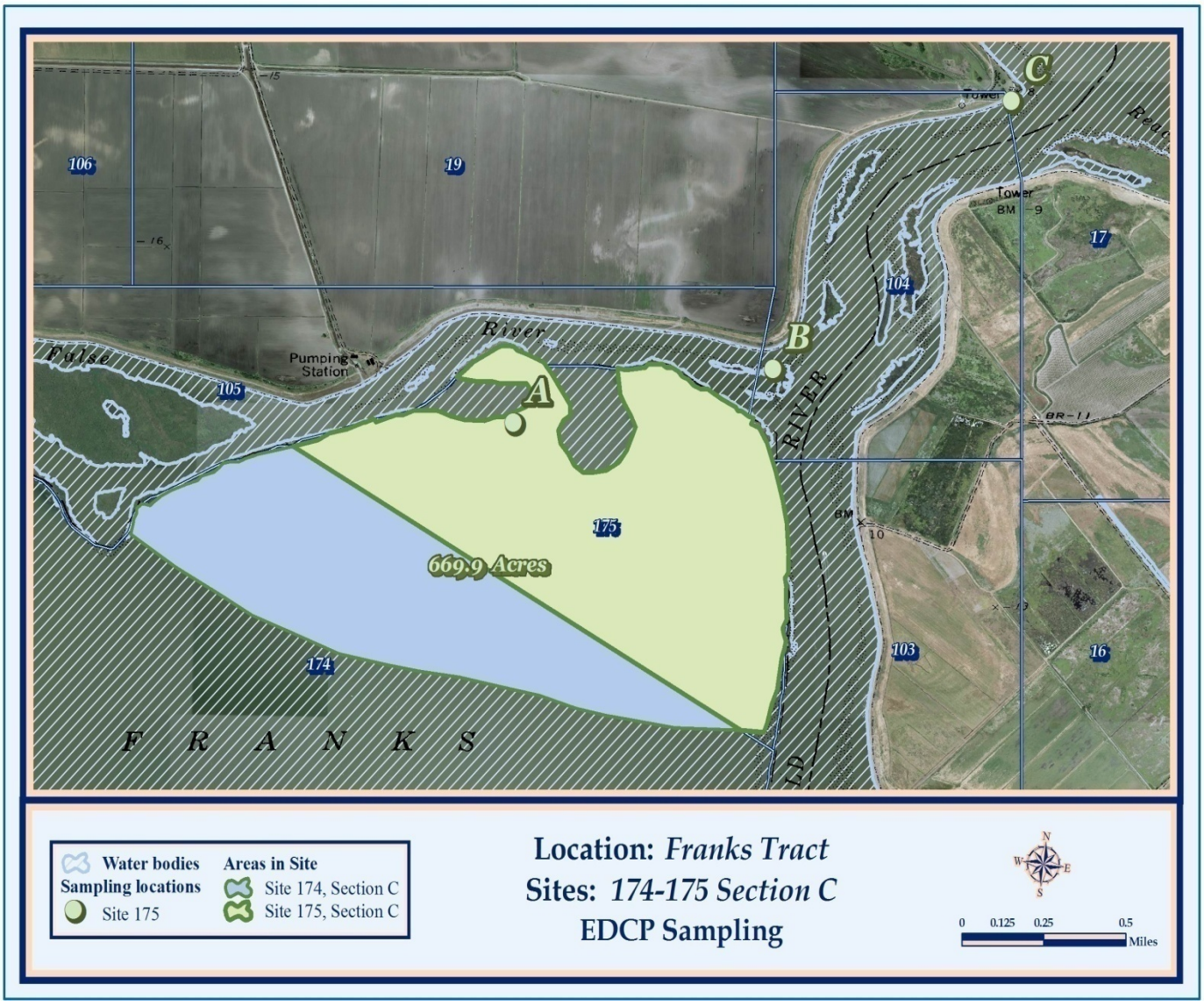


Franks Tract Site 174



Franks Tract Site 175



APPENDIX B

1 – Pesticide Use Recommendation

2 – Daily Logs

3 – FastTest Results

4 – CDFA Laboratory Residue Results

California Agriculture Pest Control Recommendation

Aquatic Herbicide or Algaecide Application

Pest Control Advisor: Kevin Naylor
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NOTE: All products recommended below are non-agriculture, general use herbicides and/or algaecides.

1) Owner of treatment site: Sacramento-San Joaquin Delta, CA Department of Boating and Waterways (lead management agency)

2) Product Name: Sonar AS (liquid), Sonar Precision Release (pellet), Sonar Quick Release (pellet)

3) Application Rate: See attached details. Sonar AS rates will range from 2-7 ppb per application and Sonar pellet (Q or PR) rates will range from 2.4-16 ppb per application. Treatment protocol is designed to maintain 1-10 ppb of Fluridone in the water column during the treatment period.

4) Water Use Restrictions: See label recommendations. Water from Sonar treated areas can be immediately used for swimming, fishing and potable uses.

Water users are not expected to be affected by the treatments scheduled under this Sonar program in 2008. In addition, FasTEST immunoassay will be used to determine actual Sonar residue present in the treated waters and near irrigation intakes during the entire treatment program. The following guidelines (as specified on the product label) will be implemented should water from these treatment sites be needed for irrigation purposes.

Water from the Sonar treated areas should not be used to irrigate established turf, row crops and tree crops if Sonar concentrations are greater than 10 ppb. Water from the Sonar treated areas should not be used to irrigate newly seeded grasses, tobacco, tomatoes, peppers and other plants in the Solanaceae family until Sonar concentrations are 5 ppb or lower.

5) Targeted Aquatic Weed or Algae: **Dominant problem species**: Brazilian elodea, *Egeria densa*

6) Recommended Treatment Protocol:

a) Time/Schedule or Conditions: Start date will be approximately April 8th.

b) Total Acreage: 3274 acres in Franks Tract (application of product will occur to an area ranging from 2572-3274 acres). Water volumes for the 2008 Franks Tract treatment area will be based upon the most recent volume calculations from ReMetrix surveys conducted in December 2006. Additional acreage may be added for the Discovery Bay treatment area. A site specific treatment plan for each site will be amended to this recommendation as needed (see attached maps).

c) Concentration (ppb): see attached - Sonar AS 2-7 ppb per application, Sonar pellet (Q or PR) 2.4-16 ppb per application

d) Criteria used determining the need for the treatment (alternative assessment):

CA Department of Boating and Waterways has been designated the lead agency to develop a control program for the aquatic weed *Egeria densa* in the Sacramento-San Joaquin Delta, Egeria Densa Control Program (EDCP). The primary objective of this program is to improve navigation in currently infested areas of the Delta by reducing the growth and spread of *Egeria.* An Environmental Impact Report (EIR) was completed in 2000 to

address potential impacts of the EDCP program. The attached Sonar treatment program for 2008, follows the treatment protocols outlined in the EIR (as modified since 2000), as well as the specific guidelines established by CA Fish and Game, US Fish and Wildlife and National Marine Fisheries Services or NOAA. The EDCP and EIR also outline other aquatic herbicide and mechanical control methods for control of *Egeria* in the Delta beyond those scheduled with the aquatic herbicide Sonar.

The use of FasTEST immunoassay will be used for monitoring Sonar residues during and post-application of Sonar in selected sites. FasTEST data will also be used to make the necessary adjustment to treatment frequency and rates (within label specifications) to achieve optimum control.

7) Expiration Date of Recommendation: October 31, 2008

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Kevin Naylor
SePRO Corporation
Pest Control Advisor
4/1/2008